WHAT WE CLAIM IS:

1. A humidification apparatus for humidifying gas for a patient or other person in need of such gas comprising:

an inlet receiving gas,

an outlet providing gas with a predetermined humidity and/or temperature,

a humidifier configured to provide water vapour to said gas passing through said humidification apparatus,

an air heater configured to directly heat said gas passing through said humidification apparatus in parallel to said humidifier,

at least one sensor configured to provide an indication of at least two of, relative humidity, absolute humidity and temperature,

a controller or processor configured to energise said humidifier and said air heater to achieve a predetermined combination of any two of absolute humidity, relative humidity and temperature.

2. A humidification apparatus as claimed in claim 1 wherein said sensor comprising an absolute humidity sensor for providing an indication of the absolute humidity of said gases flow at least one point in the flow path through said apparatus of said gases flow, and said humidifier including a body of liquid water and said gas.

3. A humidification apparatus as claimed in claim 2 wherein said humidifier comprising a metal spiral element to heat said body of water.

4. A humidification apparatus as claimed in claim 2 wherein said humidifier comprising a heated porous ceramic member adapted to be in contact with said body of water and said gas.

5. A humidification apparatus as claimed in claim 2 wherein humidifier comprising a heated semipermeable membrane adapted to be in contact with said body of water and said gas.

6. A humidification apparatus as claimed in claim 1 wherein said air heater having a humidification bypass, for allowing a portion of said gases to flow to pass from said inlet to said

outlet substantially without humidification.

7. A humidification apparatus as claimed in claim 6 wherein said humidification bypass including a bypass conduit in at least partially passing through said body of water for conveying a portion of said gas from said inlet to said outlet, and a valve provided in said bypass conduit to thereby control of the portion of said gas in said bypass conduit, the gas flowing through said bypass conduit being heated by the surrounding said body of water.

8. A humidification apparatus as claimed in claim 6 wherein said humidification bypass further having a bypass conduit for conveying a portion of said gas from said inlet to said outlet including a bypass heater adapted to heat the portion of said gas in said bypass conduit and/or said bypass conduit, and a valve provided in said bypass conduit to thereby control the portion of said gas in said bypass conduit.

9. A humidification apparatus as claimed in claims 7 or 8 wherein the restriction provided by said valve on the portion of said gas in said bypass conduit is in use permanently set.

10. A humidification apparatus as claimed in claims 7 or 8 wherein the restriction provided by said valve on the portion of said gas in said bypass conduit is in use manually adjustable.

11. A humidification apparatus as claimed in claims 7 or 8 further comprising a flow sensor providing an indication of the instantaneous flow rate of wherein said control configured to control the restriction provided by said valve means on the flow rate of the portion of said gases flow in said bypass conduit means based on said indication of instantaneous flow rate of said gases flow through said humidification chamber means, in order that the gases flow exiting from said humidification chamber means is of substantially constant humidity.

12. A humidification apparatus as claimed in claims 7 or 8 wherein said valve comprising an electromechanical actuator connected to a valve member wherein the energisation of said electromechanical actuator varies the position of said valve member thereby varying the

restriction provided by said valve means on the flow rate of the portion of said gas in said bypass conduit.

13. A humidification apparatus as claimed in claims 7 or 8 wherein said valve comprising either a valve member connected to an elastic member or an elastic valve member wherein said valve being positioned in said gases flow at said inlet and the position of said valve member or said elastic valve member thereby determines the portion of said gas in said bypass conduit.

14. A humidification apparatus as claimed in claim 13 wherein the position of said valve member or said elastic valve member providing an indication of the rate of flow of said gas at said inlet.

15. A humidification apparatus as claimed in claims 1 or 2 further comprising a conduit to convey said gas from said outlet to a patient including insulation adapted to minimise the rate of heat energy lost by said gas in said conduit, said controller adapted to energise said humidifier and said air heater to minimise the condensation of the vapour from said gases in said gases transportation pathway means while providing predetermined levels of absolute humidity.

16. A humidification apparatus for humidifying gas for a patient or other person in need of such gas comprising:

an inlet receiving gas,

an outlet providing gas with a predetermined humidity and/or temperature,

an air heater adjacent to said inlet for heating of said flow of gas,

a humidifier configured to provide water vapour to said gas passing from said heater to said outlet, in series with said heater,

at least one sensor configured to provide an indication of at least two of, relative humidity, absolute humidity and temperature,

a controller or processor configured to energise said humidifier and said air heater to achieve a predetermined combination of any two of absolute humidity, relative humidity and temperature.

17. A humidification apparatus as claimed in claim 16 wherein said air heater comprises a heater wire in a conduit connected to said inlet.